

Species of *Conotrachelus* Schönherr and *Microscapus* Lima (Coleoptera: Curculionidae: Cryptorhynchinae) Associated with *Hymenaea courbaril* Linnaeus in Central America, with Notes on the Cristatus Group of *Conotrachelus*

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ABSTRACT

The Cristatus Group of *Conotrachelus* is defined and its 9 included species keyed; natural history data are given for 3 of these species. *Conotrachelus boucheri* Whitehead is a new species of the Cristatus Group, described from specimens extracted from pods of *Hymenaea courbaril* in the Osa Peninsula of Costa Rica. Locality records are given for *Microscapus hymenaeae* Lima, based on specimens collected in association with *Hymenaea* in Panama, Venezuela, Bolivia, and Brazil.

Members of 3 weevil genera, all Cryptorhynchinae, have previously been reported in association with fruits of the legume tree *Hymenaea courbaril* L. and other *Hymenaea* spp. (Silva *et al.* 1968): *Metoposoma* Faust, *Microscapus* Lima, and *Rhinochenus* Lucas. During the course of ecological studies on *Hymenaea courbaril* in Central America and northern South America, D. H. Janzen, of the University of Michigan, has accumulated a wealth of fresh material. Included are large numbers of several species of *Rhinochenus*, which I will treat separately (Whitehead mss.), and small series each of *Microscapus hymenaeae* Lima and a new species of *Conotrachelus* Schönherr as reported below. In order to place the new species of *Conotrachelus* in some meaningful systematic context, I establish herein, as a group of convenience, the Cristatus Group of *Conotrachelus*, include a key to known species, and indicate available ecological data.

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tinued financial support from NSF Grant GB 35032X. This study is based on specimens housed in the U.S. National Museum of Natural History, Washington, D.C.

Terminology.—In general I follow accepted terminology as heretofore used in studies on Curculionidae, but explanations are needed for the various terms used to describe integumental microsculpture. I use the term "isodiametric" if the meshes of the microsculpture form a flat honeycomb effect, "granulose" if the meshes are similar in form but tuberculose rather than flattened, or "stretched" if the meshes are clearly elongated. The arrangement of the "stretched" meshes on the pronotum and elytra is roughly transverse on average, and on the pronotum it matches the general orientation of punctations, rugosities, and other macrosculpture.

The Cristatus Group of *Conotrachelus*

Diagnostic combination.—Several species of *Conotrachelus* form an easily distinguished though not necessarily natural group, having the following characteristics in combination:

Apex of each elytron with conspicuous bare area; front coxae contiguous; femora bidentate; elytral intervals 3, 5, 7, and 9 costate, costae of intervals 3 and 5 or 3, 5, and 7 interrupted; and pronotum with lateral discal longitudinal stripes of condensed vestiture and without tubercles.

The *Cristatus* Group, as construed herein, may be useful for no more than recognition purposes. Similarity in external morphology may not correlate with similarity in genital morphology. I cannot, however, make broader comments on relationships without a better representation of members of the group and without first completing a thorough survey of the genus.

Key to species.—All previously described species of the *Cristatus* Group have been treated by Champion (1904, Central America) and Fiedler (1940, South America). I attempt in the following key to distinguish these 7 species, a new species described below, and 1

additional undescribed species. As I have seen specimens of only 6 of the 9 species, the key is based in part on the literature and hence may not prove wholly successful. I am confident of all determinations except that of *C. abdominalis*, which is not adequately distinguished in Fiedler's keys or descriptions.

Natural history.—Some natural history data are available for 3 species of the *Cristatus* Group. The specimens of *boucheri* were extracted from pods of *Hymenaea courbaril*. Various specimens of *cristatus* are labelled "am Licht," "am trochnem Holz," "am trochnem Holz nachts," "an welkem Laub *Hibiscus esculentus*," "at light," "banana ship," "bananas," "in brown sugar fruit fly trap," "*Inga* blüthen," or "on cacao." Specimens of the undescribed species are labelled "bred from celery," "reared from Sweet Potato," or "on parsley."

- 1. Rostrum slender, not compressed; vestiture of dorsum white or yellow 2
- Rostrum stout, compressed; vestiture of dorsum white 6
- 2. Rostrum greatly elongated, in female about twice as long as head and pronotum combined and with antennal insertion near middle, in male shorter and with antennal insertion near apical $\frac{1}{2}$; vestiture of dorsum white or yellow 3
- Rostrum shorter, antennal insertion much nearer apex in both sexes; vestiture of dorsum yellow 5
- 3. Elytral intervals 5 and 7 feebly costate. (No specimens seen, described from "Cayenne") *C. numenius* Fiedler
- Elytral intervals 5 and 7 strongly costate 4
- 4. Vestiture of dorsum yellow. (No specimens seen, described from Volcan de Chiriqui, Panama) *C. divergatus* Champion
- Vestiture of dorsum white. (Three specimens seen, from "Guyana" and "Para") *C. iris* Fiedler
- 5. Bare areas at elytral apices contiguous, dense vestiture of sutural intervals ending near middle of bare areas. (Many specimens seen, from various localities in Brazil and Paraguay) *C. praeustus* Boheman
- Bare areas at elytral apices well-separated, dense vestiture of sutural intervals ending near apex of bare areas. (Four specimens seen, from Osa Peninsula, Costa Rica) *C. boucheri* Whitehead, NEW SPECIES
- 6. Elytral intervals 5 and 7 feebly costate. (No specimens seen, described from "Brazil") *C. obsoletus* Fiedler
- Elytral intervals 5 and 7 strongly costate 7
- 7. Last visible abdominal sternum coarsely punctate mesally; vestiture of middle and hind femora yellow. (Many specimens seen, from various localities in Brazil and Peru) *C. abdominalis* (Fabricius)
- Last visible abdominal sternum finely punctate mesally; vestiture of middle and hind femora white 8
- 8. Pronotum coarsely rugose, microsculpture stretched. (Many specimens seen, from various localities ranging from Mexico to Peru and northern Brazil)
- *C. cristatus* Fähræus
- Pronotum finely rugose, microsculpture granulose. (Many specimens seen, from various localities in Argentina and Uruguay)
- *C. sp. nr. cristatus*, probably undescribed

Conotrachelus boucheri Whitehead,
New Species

Type-material.—Holotype female labelled "C. R. Puntarenas. nr. Rincon, Osa Peninsula. 12 March 1972. D. A. Boucher" and "ex *Hymenaea courbaril* pods CR-Osa: D. Janzen 12 March 1972". Three female paratypes, same label data. Holotype and paratypes deposited in U.S. National Museum of Natural History, Washington; USNM holotype #73362.

Diagnostic combination.—This species is distinguished from other members of the *Cristatus* Group by characteristics given in the key. It is most similar in appearance to *C. praeustus* but is smaller and broader as well as having clearly separated bare areas at the elytral apices.

Conotrachelus boucheri is 1 of 3 members of the *Cristatus* Group known to occur in Central America. Females of *boucheri*, unlike those of *divirgatus*, have the rostrum only about as long as the head and pronotum combined and with the antennal insertion near the apical $\frac{1}{3}$. In addition to having the rostrum slender and the vestiture of the dorsum and middle and hind femora yellow, specimens of *boucheri* differ from those of *cristatus* by having the costa of interval 7 feebly rather than strongly interrupted, pronotum not rugose, and last visible abdominal sternum coarsely and densely punctate mesally.

Description of female.—Length, pronotum (1.4 mm) + elytron (3.2 mm) = 4.6 mm; width of pronotum, 1.6 mm; width of elytra, 2.0 mm. Length of rostrum, base of mandible to apex of antennal insertion (0.36 mm) + apex of antennal insertion to frontal fovea (1.33 mm) = 1.69 mm; length from frontal fovea to base of pronotum, 1.67 mm. (For general statement of relative position of antennal insertion: length of rostrum, apex of mandible to apex of antennal insertion (0.47 mm) + apex of antennal insertion to eye (0.93 mm) = 1.40 mm; length from antero-ventral margin of eye to base of pronotum, 1.71 mm). Maximum width of rostrum, 0.29 mm; width of head across eyes, 0.93 mm; width of frons between eyes, 0.22 mm. Length of antenna,

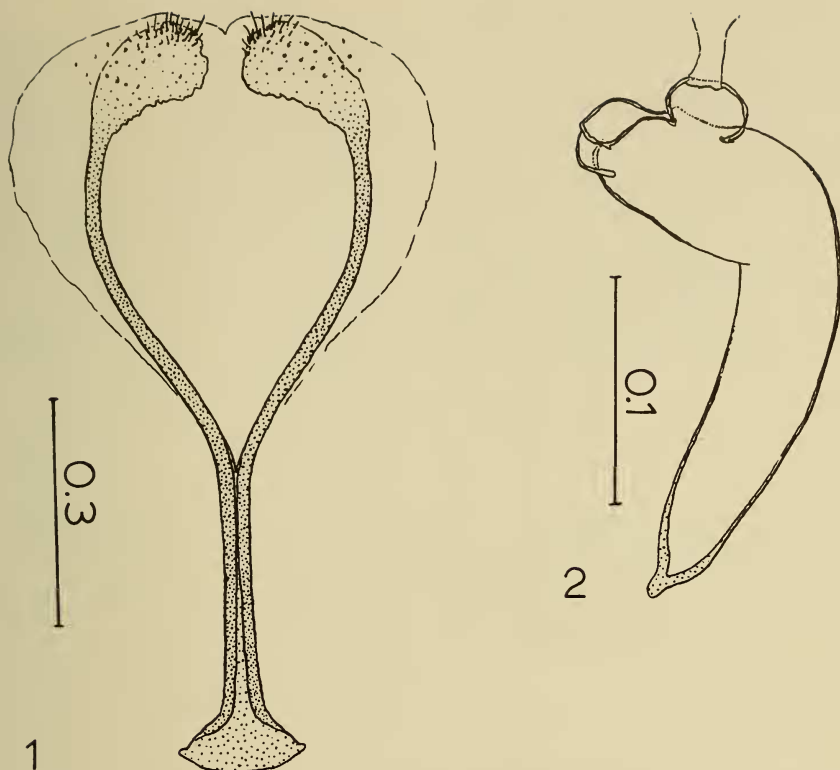
scape (0.78 mm) + funicle (0.67 mm) + club (0.33 mm) = 1.78 mm; second funicle segment 3 times as long as wide, about $\frac{3}{4}$ as long as first.

Integument castaneous, venter rufopiceous. Vestiture recumbent, scales slender, subsetiform; pattern of dorsum about as in *cristatus* (see Champion 1904, plate 19, Fig. 9) except pronotum with discal stripes less developed and with lateral marginal pale stripe; vestiture throughout mostly of yellow to pink scales, white on posterolateral margins of pronotum and on scutellum; vestiture moderately sparse dorsally except where concentrated in pronotal stripes and along basal margin of glabrous area at elytral apex, sparse ventrally, nearly uniformly dense on dorsal surfaces of femora. *Rostrum* quadrisulcate above; median carina broad, rounded, polished; finely, sparsely punctate in apical $\frac{1}{2}$; vestiture sparse in basal $\frac{1}{2}$ except above eyes; width nearly uniform except for slight constriction in front of antennal insertion; depth about $1\frac{1}{2}$ times greater at base than apex. *Head* densely punctate; frontal fovea deep; short, vague, longitudinal median carina extended backward from fovea. *Prothorax* above densely, coarsely punctate, punctures partially confused but surface not rugose, some fine punctures on interstices; interstitial microsculpture transversely stretched; pronotum with short, vague, median longitudinal carina in apical $\frac{1}{2}$ and with shallow transverse impression in apical $\frac{1}{4}$, otherwise without distinctive tubercles or impressions; pronotum not angulate laterally, slightly wider at middle than at base; rostral canal deep. *Elytron* with stria punctures deep, each puncture with slender white scale; intervals finely tuberculate; intervals 3, 5, 7, and 9 costate; costae of intervals 3 and 5 each twice interrupted and with middle segment strongly raised; costa of interval 7 feebly interrupted behind humerus; glabrous area at apex with few, scattered, setiform scales, dense scales of sutural interval extended nearly to apex of glabrous area. *Venter* of pterothorax densely, coarsely punctate; abdomen finely punctate, last visible abdominal sternum densely, coarsely punctate throughout. *Legs* with femora bidentate ventrally, distal tooth small; distal comb of tibia orange. *Female genitalia* with spiculum ventrale and spermatheca as in Figs. 1–2.

All 4 specimens are virtually uniform in size and structure; measurements are based on the holotype.

Discussion.—I take pleasure in naming this species for D. A. Boucher, collector of the type-material.

According to D. H. Janzen (*in litt.*), "... if I recall correctly (these weevils) were living inside of the pods (of *Hymenaea courbaril*) and had drilled out four different seeds. On the other hand,



Female genitalia of *Conotrachelus boucheri* Whitehead; line scales in mm. Fig. 1, spiculum ventrale; fig. 2, spermatheca.

if I also recall correctly, these were in pods that had been exited by *Rhinochenus* and it may well be that they come into the pod after the *Rhinochenus* have left." Obviously, more field investigation is needed to work out exact ecological interactions among *Conotrachelus boucheri*, the holedriller species of *Rhinochenus*, and *Hymenaea courbaril*. Preliminary evidence, however, does suggest that *C. boucheri* is a secondary seed predator dependent on *Rhinochenus* for access to its food supply.

Also according to Janzen (*in litt.*), the weevils were collected "within two miles of Rincon . . . from *Hymenaea* trees growing along what is commonly known as the Holdridge Ridge Trail which is roughly one mile south of the Rincon Airport and about 20 to 50 meters in elevation. It is on red lateritic

hilly soil." There is presently some doubt that this population of *Hymenaea* is conspecific with *H. courbaril*, but Janzen thinks the Osa and Guanacaste populations are continuous.

***Microscapus hymenaeae* Lima**

This species was described from specimens collected in fruits of *Hymenaea* sp. from 2 localities in Brazil: Cantareira, São Paulo and Santa Luzia, Minas Gerais. The original description and photographs (Lima 1950) and association with *Hymenaea* are adequate for reliable species identification. I examined 50 adult specimens from Central and South America, and found no important variation in external features or in female or male genitalia. Records cited below include the first report of this species in Central America.

Distribution records.—PANAMA. Cocle: Rio Hato, 8.I.1971, D. Wilson, from pods of *Hymenaea courbaril* (1 male). VENEZUELA. Barinas: Barancas, 21.X.1973, D. H. Janzen, from pods of *Hymenaea courbaril* (3 adults). BOLIVIA. Beni: Rurrenabaque, XII.1921, W. M. Mann, from "Paco bean" (*Hymenaea* sp.) (37 adults, 11 immatures). BRAZIL. Goiás: Ilha do Bananal, 21.IX.1926, E. G. Holt, from "fruit of Jatoba" (*Hymenaea* sp.) (9 adults).

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Euceraphis punctipennis (Zetterstedt), the Fourth Aphid Species with Four Cornicles (Hemiptera: Homoptera: Aphididae)

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ABSTRACT

An adult *Euceraphis punctipennis* (Zetterstedt) is the first winged specimen and the first species of the aphid subfamily Drepanosiphinae to be recorded as having 4 cornicles.

A winged adult female of *Euceraphis punctipennis* (Zetterstedt) with the unusual characteristic of 4 cornicles was found among aphids collected from *Betula* sp., Mesa, Colorado, 8 June 1967, by the late F. C. Hottes. The aphid is typical in other structures, and it is the only one of the 80 individuals of the lot that exhibits a duplication of cornicles.

The adventitious cornicles are located dorsally near the body margin on abdominal segment VI, almost directly posterior to the typical pair on segment V. The posterior cornicles are virtually the same shape and length as the anterior ones, but in diameter are approximately

1/3 narrower than the anterior ones. The structure of the supplementary cornicles appears to be similar to that of the typical pair.

This example of *punctipennis* is the third winged aphid and the first species of the Drepanosiphinae recorded as having supplementary cornicles. Previously wingless examples of 3 species of the Aphidinae have been reported to have more than the 1 typical pair. In most of these insects, however, the size of the additional cornicles does not equal that of the typical ones in any dimension.

Zirnits (Fol. Zool. Hydrobiol. 2: 1–3, 1930) observed branched cornicles in